PROBABILITY!

ONE

GENERAL MATHS

PRELIMINARY

NAME _____

PRELIMINARY CAPACITY MATRIX – GENERAL MATHEMATICS

TOPIC: Probability 1 – The Language of Chance **2 weeks**

CONTENT	CAPACITY BREAKDOWN!	DONE IT!!!!	GOT IT!!!!!	ON MY WAY!	WORKING ON IT!	HELP!!!!
1. Ordering everyday events	SS14.1-4 Ex 14A a, c, e, g in each question					
2. Identifying sample space	SS14.5 Ex 14BQ4 - 15					
3. Tree diagrams to present sample space	Ex 14C even questions					
4. Equally likely outcomes	Ex 14D odd questions					
5. Fundamental Counting principle for multistage events	Ex 14E even questions					

Your say!

What was the most important thing you learned?_____

What was something new you learnt? _____

What part(s) of this topic will you need to work on? _____

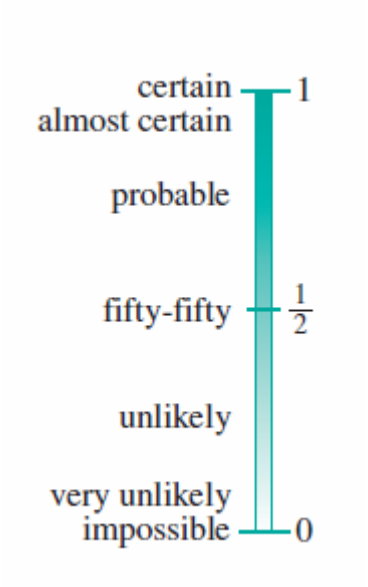
INFORMAL DESCRIPTION OF CHANCE

The chance of an event occurring ranges from being **certain** to **impossible**.

An event that is certain has a probability of 1.

An event that is impossible has a probability of 0.

There are many terms that can describe the chance of an event occurring.



eg Describe the chance of each of the following events occurring:

Tossing a coin and it landing Tails _____

Winning Lotto _____

Rolling a 5 with one die _____

Selecting a numbered card from a standard deck. _____

eg Belinda is expecting her cousins to arrive between August 20 and 26. Is it more likely that her cousins will arrive on a weekday or weekend? Justify your answer.

eg A card is selected from a standard deck. List the following outcomes from least likely to most likely:

Selecting a 2

Selecting a picture card

Selecting a Spade

Selecting a red card.

WHAT IS IN A DECK OF CARDS?

Understanding a deck of cards

A standard deck of playing cards consists of 52 cards. All cards are divided into 4 suits. There are two black suits — spades (♠) and clubs (♣) — and two red suits — hearts (♥) and diamonds (♦). In each suit there are 13 cards including a 2, 3, 4, 5, 6, 7, 8, 9, 10, a jack, a queen, a king and an ace. (Note that there is no 1.) The jack, queen and king are called picture cards.

SAMPLE SPACE

- **The sample space is the list of all possible outcomes in a probability experiment.**
- **The number of elements in a sample space is the total number of possible outcomes.**
- **There may be several elements that are the same. You may be asked to count the number of distinct (different) elements in the sample space.**

eg List the sample space for rolling a die.

eg In a bowl there are 4 red M&Ms, 2 yellow M&Ms and 3 blue M&Ms.

a) List the sample space;

b) How many elements are in the sample space?

c) How many distinct elements are in the sample space?

USING TABLES 2 DICE

Create a table to show all possible outcomes when rolling two dice

	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

If two dice are rolled, find the number of outcomes of getting:

a) a 4 and 3;

b) any double;

c) at least one 6

Create a table to show all possible outcomes when rolling two dice and collating their sum (always a positive value)

	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

Two dice are rolled and the sum of the two values are collated. Find the number of outcomes for rolling

a) a sum of six;

b) a difference less than 5

TREE DIAGRAMS

- A Tree diagram is necessary in any example where there is more than one stage to the probability experiment.
- A **Tree diagram** presents all possible outcomes – there are no probability values presented on the branches. We use these when there are a small number of outcomes.
- Once the tree is drawn, the sample space is found by following the branches to each end.

eg The numbers 1, 2, 3 and 4 are each written on a separate card. One card is chosen at random, its number recorded and the card is removed. Another card is chosen in the same fashion, then another to create a two digit number.

a) Present all possible outcomes using a tree diagram;

b) What is the number of outcomes for :

   i. An odd number;

   ii. Less than 400;

   iii. Not an even number;

   iv. Greater than 200

eg If there are three children in a family, draw a tree diagram to list all possible combinations of boys and girls.

EQUALLY LIKELY OUTCOMES

- Outcomes will be **equally likely** if a selection is random. When other factors influence the selection then each outcome is not equally likely.
- When there are more than one event involved, examine the tree diagram to determine if events described are equally likely.

eg When two coins are tossed there are three possible outcomes. Draw a tree diagram to list all outcomes and state whether each outcome is equally likely, justifying your answer.

THE FUNDAMENTAL COUNTING PRINCIPLE

- The **fundamental counting principle** technique calculates the number of different ways that separate events can occur.
- The **TOTAL NUMBER OF WAYS** that a succession of choices can be made is found by **MULTIPLYING** the number of ways **EACH SINGLE CHOICE** could be made.

eg A three course meal is to be served at Mitch's birthday tea. Guests choose one plate from each course:

Entrée	Main Course	Dessert
Soup	Spaghetti	Sorbet
Calamari	Ribs	Pavolva
Sushi	Grilled Fish	Lemon Tart
Dips	Gnocchi	
	Seafood Platter	

In how many ways can the three courses for the meal be chosen?

eg If a motor vehicle number plate consist of 4 letters and 2 numbers, how many different plates are possible if the first letter must be D, E or F and the first digit cannot be 5 or 6?